

Conversion Factor Assignment

1. Sodium hypochlorite, NaOCl , is the active ingredient in a number of commercial bleaches. A typical bleach contains approximately 5 g of sodium hypochlorite in every 100 mL of bleach. How many moles of sodium hypochlorite are in a 1.0 L bottle of bleach?
2. Vinegar is a dilute solution of acetic acid, CH_3COOH . A 2.0 L bottle of vinegar contains approximately 2 mol of acetic acid. What mass of acetic acid is present in the bottle?
3. In 1982, Canada produced 62 456 kg of gold and 5196 t of potash, K_2CO_3 . Calculate the number of moles of each substance produced.
4. Calculate the mass of
 - (a) 9.225 mol of vitamin D_1 , $\text{C}_{56}\text{H}_{88}\text{O}_2$
 - (b) 1.62 mol of monosodium glutamate, $\text{NaC}_5\text{H}_8\text{O}_4\text{N}$.
5. Patients who have to have X-rays taken of their intestinal tract are given, prior to the X-ray, a drink containing barium sulphate, BaSO_4 . Since X-rays cannot pass through the barium sulphate, an image of the intestinal tract appears on the X ray film. If 0.482 mol of barium sulphate is used, what mass of barium sulphate is added to the drink?
6. Roloids tablets contain sodium dihydroxyaluminum carbonate, $\text{Na}(\text{OH})_2\text{AlCO}_3$, which neutralizes excess stomach acid. If each tablet contains 335 mg of this ingredient, calculate the number of moles of the compound in a 20-tablet package of Roloids. Hint: start with 1 package (where package is the unit)
7. Propane, C_3H_8 , used in gas barbecues is usually sold by massing the empty tank, then adding propane until a certain mass is reached. If 2.5 kg of propane is purchased, how many moles of propane does this represent?
8. An artificial flavouring agent that simulates the flavour of peaches has the formula $\text{C}_6\text{H}_{12}\text{O}_2$.
 - (a) How many moles of molecules are present in 1.00 g of the compound?
 - (b) How many moles of carbon atoms, hydrogen atoms, and oxygen atoms are present in the same sample? (note this is three separate calculations)

Answers:

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| 1. | 0.672 mol NaOCl | 6. | 0.0465 mol $\text{Na}(\text{OH})_2\text{AlCO}_3$ |
| 2. | 120.12 g CH_3COOH | 7. | 56.7 mol C_3H_8 |
| 3. | 317000 mol Au | 8. | 0.00861 mol $\text{C}_6\text{H}_{12}\text{O}_2$ |
| | 3.76×10^7 mol K_2CO_3 | | 0.0516 mol C |
| 4. | 7320 g $\text{C}_{56}\text{H}_{88}\text{O}_2$ | | 0.103 mol H |
| | 274 g $\text{NaC}_5\text{H}_8\text{O}_4\text{N}$ | | 0.0172 mol O |
| 5. | 112 g BaSO_4 | | |